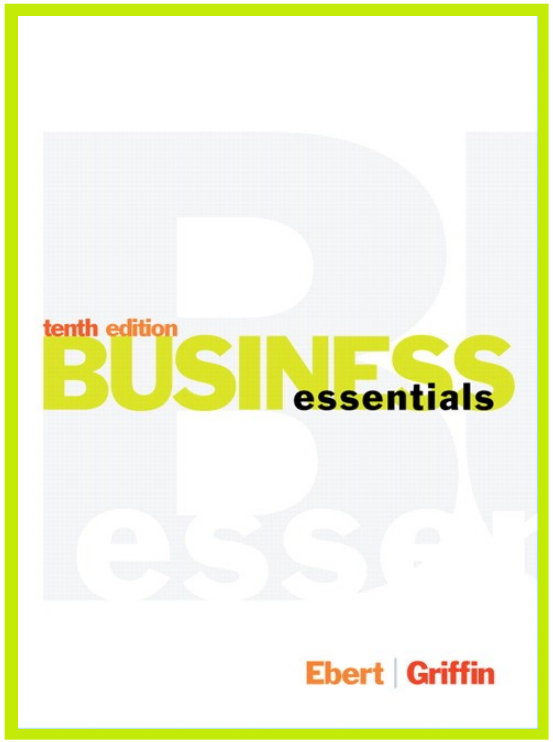

Operations Management and Quality for Producing Goods and Service

chapter # 7

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learning objectives

1. ***Explain*** *the meaning of the term production or operations.*
2. ***Identify*** *the characteristics that distinguish service operations from goods production.*
3. **Explain** how companies with different business strategies are best served by having different operations capabilities.
4. ***Identify*** *the major factors that are considered in operations planning.*
5. ***Discuss*** *the information contained in four kinds of operations schedules—the master operations schedule, detailed schedule, staff schedule, and project schedule.*
6. ***Discuss*** *the two key activities required for operations control.*
7. ***Identify*** *the activities and underlying objectives involved in total quality management.*
8. ***Explain*** *how a supply chain strategy differs from*

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What Does Operations Mean Today?

- **Operations (Production)**
  - activities involved in making products — goods and services — for customers.
- **Service Operations (Service Production)**
  - activities producing intangible and tangible products, such as entertainment, transportation, and education.
- **Goods Operations (Goods Production)**
  - activities producing tangible products, such as radios, newspapers, buses, and textbooks

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Growth in the Services and Goods Sectors

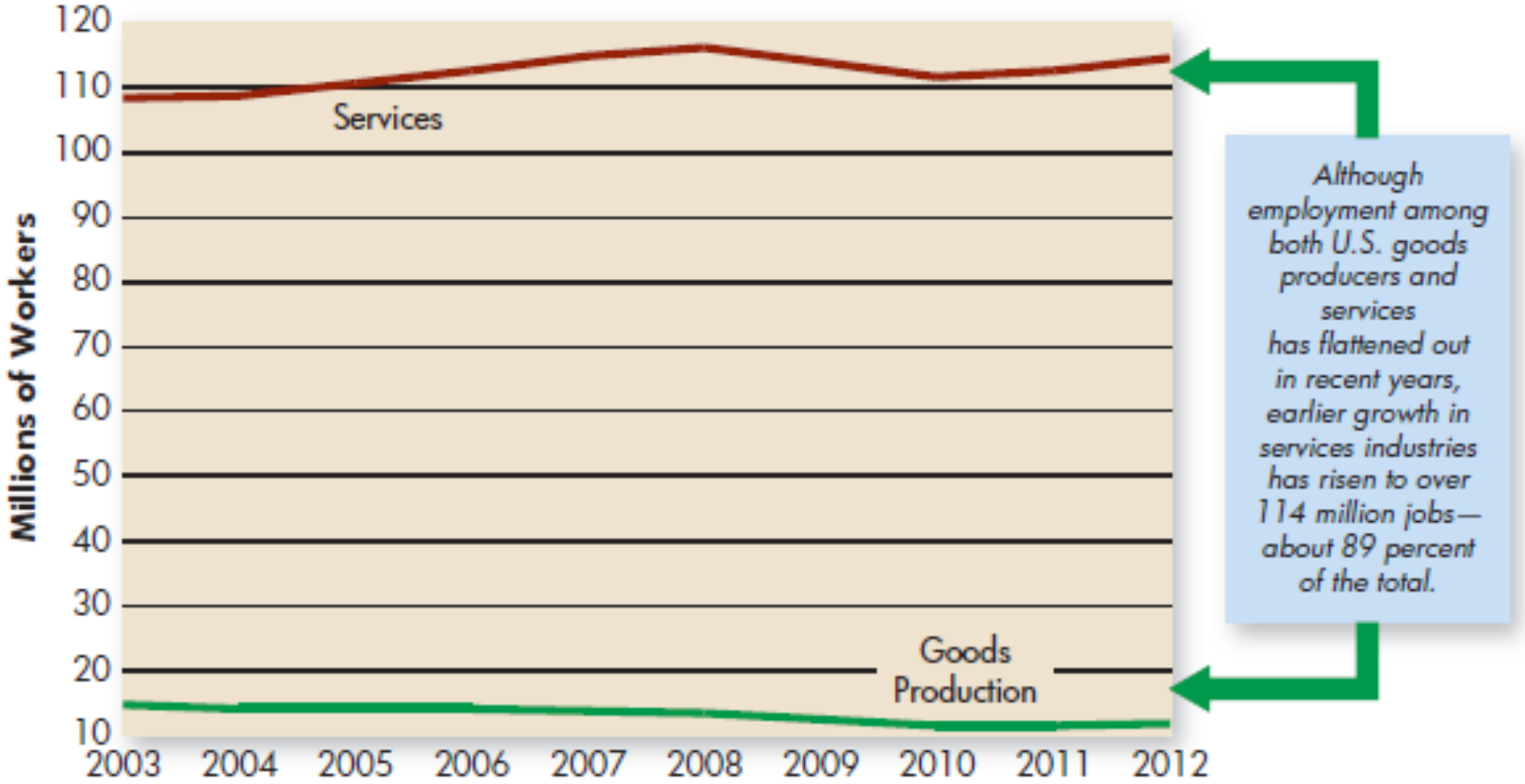

FIGURE 7.1 Employment in Goods and Services Sectors

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GDP from Goods and Services

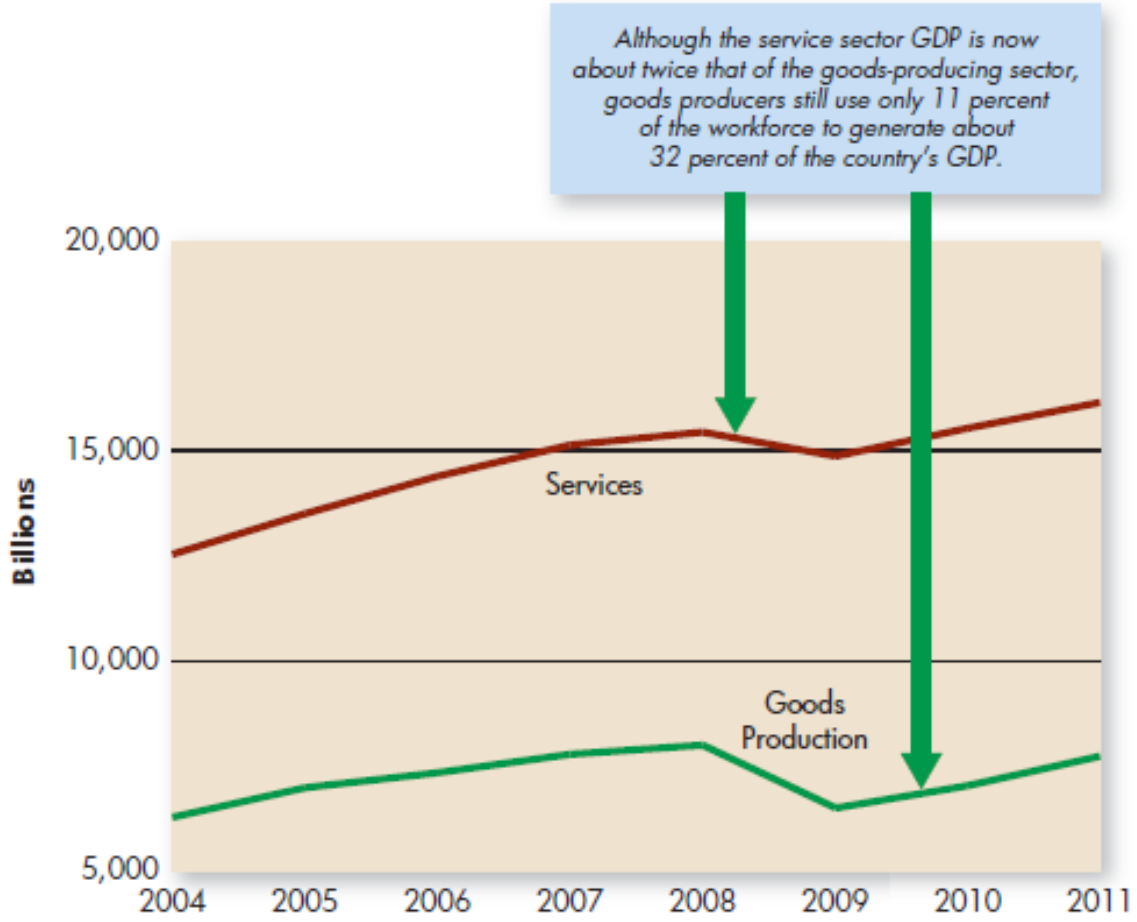

FIGURE 7.2 GDP from Goods and Services

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Creating Value Through Operations

- **Production**
  - makes products available: By converting raw materials and human skills into finished goods and services, production creates utility.
- **Utility**
  - product's ability to satisfy a human want or need (customer value)
  - Creating a product that customers value results from organized efforts (operation management).

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Operations Management

- **Operations (Production) Management**
  - systematic direction and control of the activities that transform resources into finished products that create value for and provide benefits to customers.
- **Operations (Production) Managers**
  - managers responsible for ensuring that operations activities create value and provide benefits to customers.

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The Resource Transformation Process

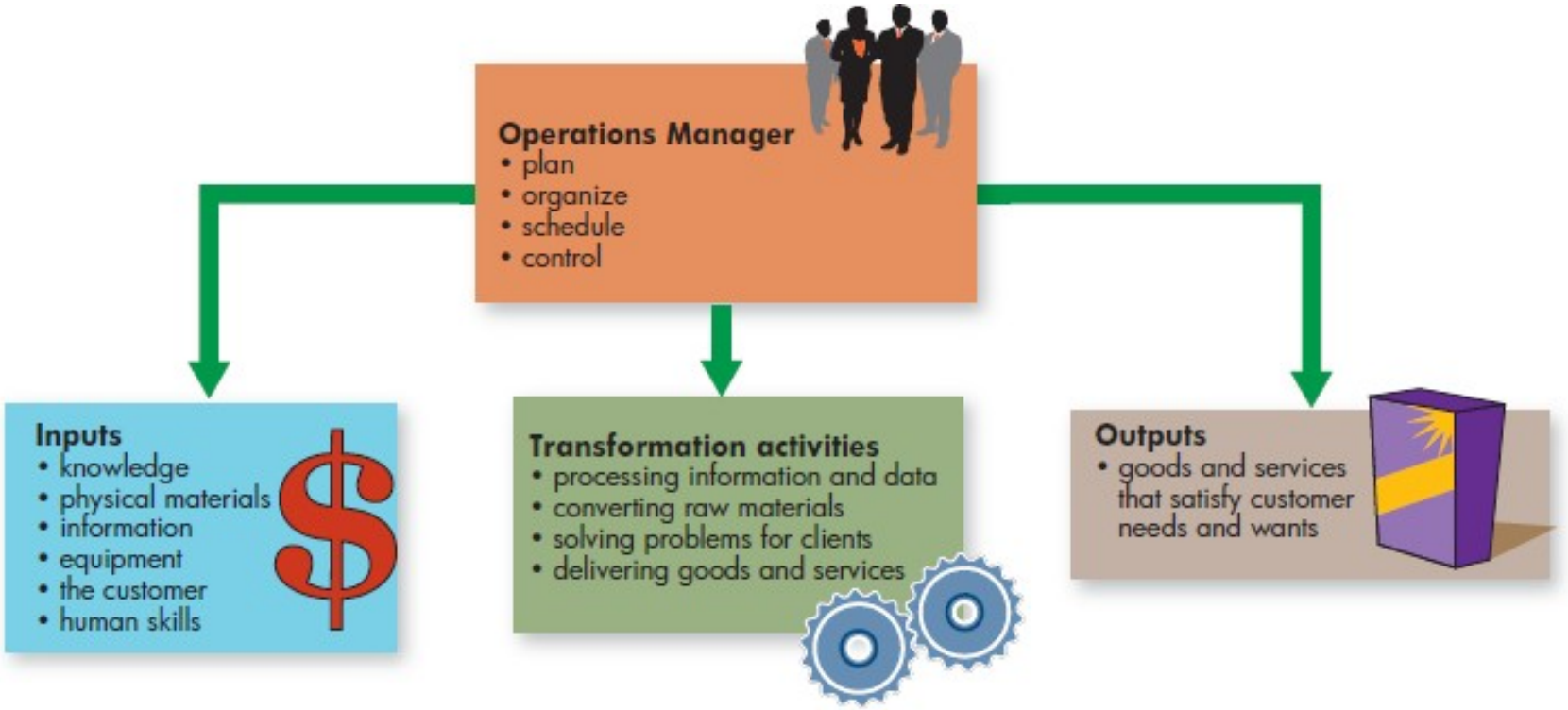

FIGURE 7.3 The Resource Transformation Process

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Differences between Service and Goods Manufacturing Operations

- **Interacting with customers**
- **The intangible and unstorable nature of some services**
- **The customer's presence in the process**
- **Service quality considerations**

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Operations Processes

- **Operations Process**
  - Set of methods and technologies used to produce a good or a service.
  - Operations processes **for goods** can be classified to whether "make-to-order or make-to-stock:
    - **Make-to-Order Operations**
      - activities for one-of-a-kind or custom-made production.
    - **Make-to-Stock Operations**
      - activities for producing standardized products for mass consumption.

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Operations Processes

- Operations processes **for Services** can be classified according to extent of customer contact:

  - **Low-Contact System**
    - level of customer contact in which the customer need not be part of the system to receive the service (e.g. postal operations).
  - **High-Contact System**
    - level of customer contact in which the customer is part of the system during service delivery (e.g. transportation).

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Business Strategy and Operations

- **Business strategy**
  - Each firm selects a business strategy that attract customers such as: quality, low price, flexibility, and dependability).
  - Business strategy determines operations capabilities and successful firms design their operations to support the company's business strategy.
- **Operations Capability (Production Capability)**
  - special ability that production does especially well to outperform the competition.

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Business Strategies That Win Customers for Four Companies

table 7.1 Business Strategies that Win Customers for Four Companies

Company	Strategy for Attracting Customers	What the Company Does to Implement Its Strategy
Toyota	Quality	Cars perform reliably, have an appealing fit and finish, and consistently meet or exceed customer expectations at a competitive price
Save-A-Lot	Low price	Foods and everyday items offered at savings up to 40 percent less than conventional food chains
3M	Flexibility	Innovation, with more than 55,000 products in a constantly changing line of convenience items for home and office
FedEx	Dependability	Every delivery is fast and on time, as promised

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Operations Capabilities and Characteristics for Four Companies

table 7.2 Operations Capabilities and Characteristics for Four Companies

Operations Capability	Key Operations Characteristics
Quality (Toyota)	• High-quality standards for materials suppliers • Just-in-time materials flow for lean manufacturing • Specialized, automated equipment for consistent product buildup • Operations personnel are experts on continuous improvement of product, work methods, and materials
Low Cost (Save-A-Lot)	• Avoids excessive overhead and costly inventory (no floral departments, sushi bars, or banks that drive up costs) • Limited assortment of products, staples, in one size only for low-cost restocking, lower inventories, and less paperwork • Many locations; small stores—less than half the size of conventional grocery stores—for low construction and maintenance costs • Reduces labor and shelving costs by receiving and selling merchandise out of custom shipping cartons
Flexibility (3M)	• Maintains some excess (expensive) production capacity available for fast startup on new products • Adaptable equipment and facilities for production changeovers from old to new products • Hires operations personnel who thrive on change • Many medium- to small-sized manufacturing facilities in diverse locations, which enhances creativity
Dependability (FedEx)	• Customer automation: uses electronic and online communications tools with customers to shorten shipping time • Wireless information system for package scanning by courier, updating of package movement, and package tracking by customer • Maintains a company air force, global weather forecasting center, and ground transportation for pickup and delivery, with backup vehicles for emergencies • The 25 automated regional distribution hubs process 3.5 million packages per day for next-day deliveries

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Operations Planning and Control

The business plan and forecasts developed by top managers provide guidance for long-term operations plans. Covering a two-to five-year period, the operations plan anticipates the number of plants or service facilities and the amount of labor, equipment, transportation, and storage needed to meet future demand for new and existing product

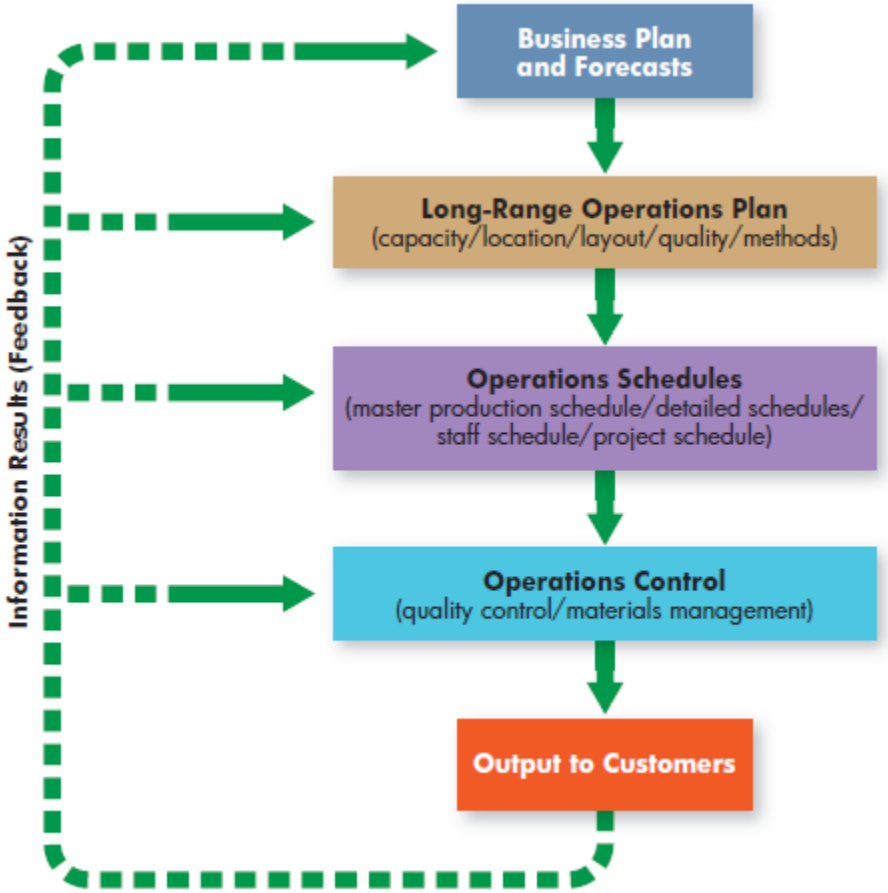

FIGURE 7.4 Operations Planning and Control

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Operations Plan categories

- **Capacity Planning**
  - determining the amount of a product that a company can produce under normal conditions.
  - A firm's capacity depends on how many people it employs and the number and size of its facilities.
- **Location Planning**
  - determining where production will happen based on costs and flexibility.
- **Layout Planning**
  - planning for the layout of machinery, equipment, and supplies
- **Quality Planning**
  - Every operations plan include activities for insuring the products meet quality standards.
- **Methods planning**
  - It contain production steps and methods for performing them.

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Layout Planning

- **Among the many layout possibilities, two well known are:**

- **Process Layout (Custom-Product Layout)**
  - physical arrangement of production activities that groups equipment and people according to function.
- **Product Layout (Same-Steps Layout)**
  - physical arrangement of production steps designed to make one type of product in a fixed sequence of activities according to its production requirements.
  - Assembly Line Layout is a same-steps layout used in case of large volume or production, in which a product moves step by step through a plant on conveyor belts or other equipment until it is completed.

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Process Layout for a Service Provider

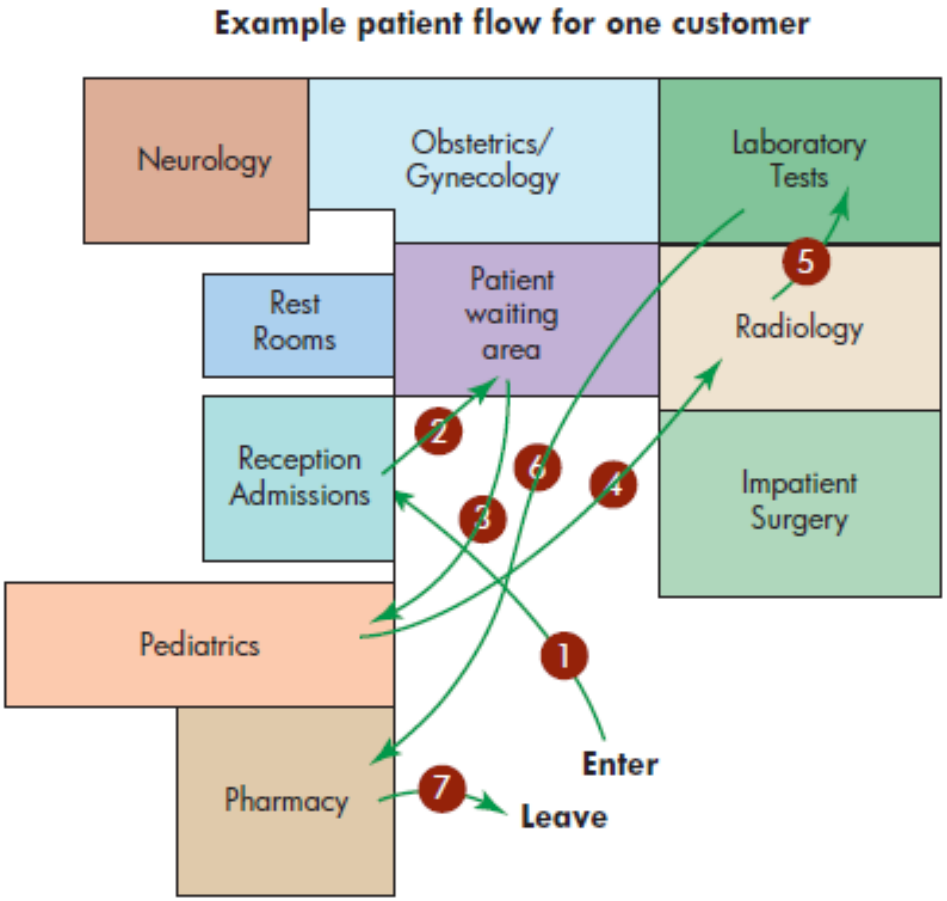

FIGURE 7.5 Process Layout for a Service Provider—a Medical Clinic

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Product Layout for a Service

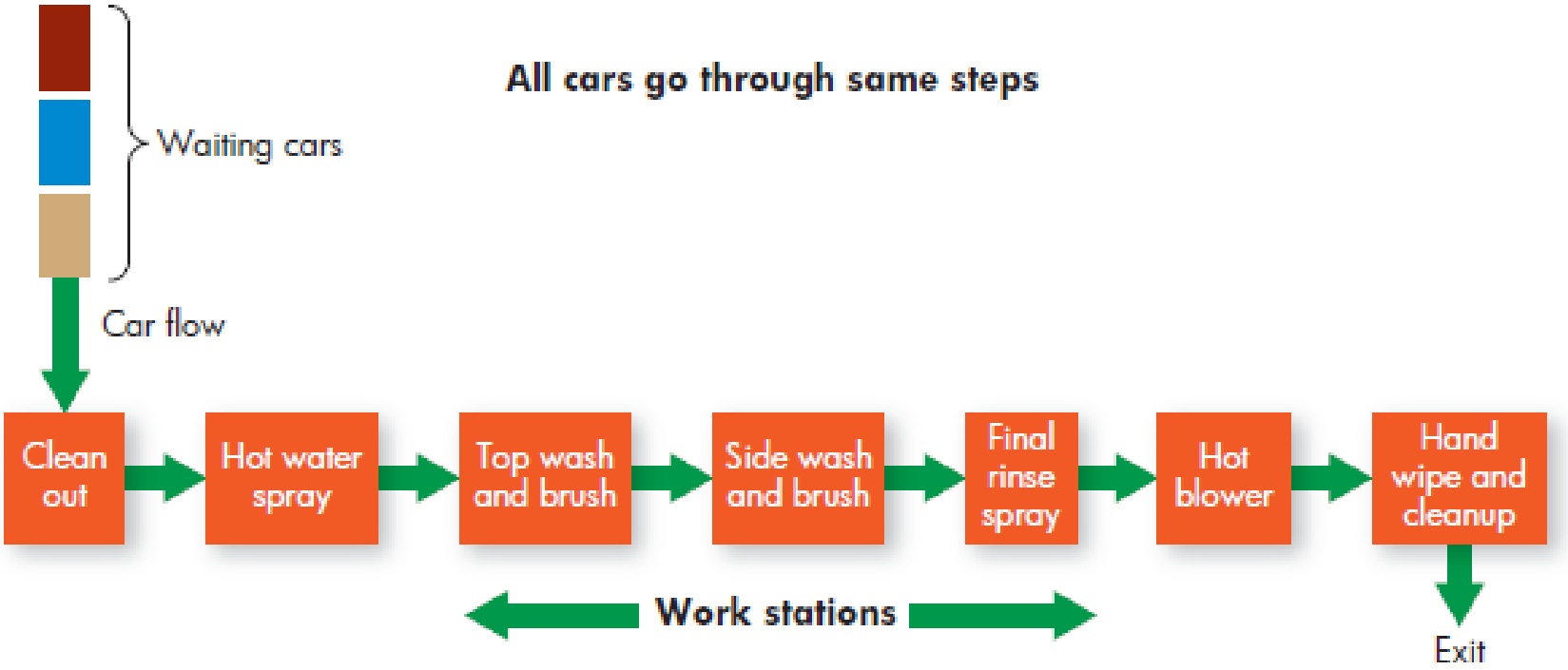

FIGURE 7.6 Product Layout for a Service—Automated Car Wash

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Quality Planning

- **Quality**
  - combination of “characteristics of a product or service that bear on its ability to satisfy stated or implied needs”.
  - Early in the planning process, goals are established for both performance and consistency:
    - ✓ **Performance**: dimension of quality that refers to how well a product does what it is supposed to do.
    - ✓ **Consistency:** dimension of quality that refers to sameness of product quality from unit to unit.

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Methods panning
Flowchart of Traditional Guest Checkout

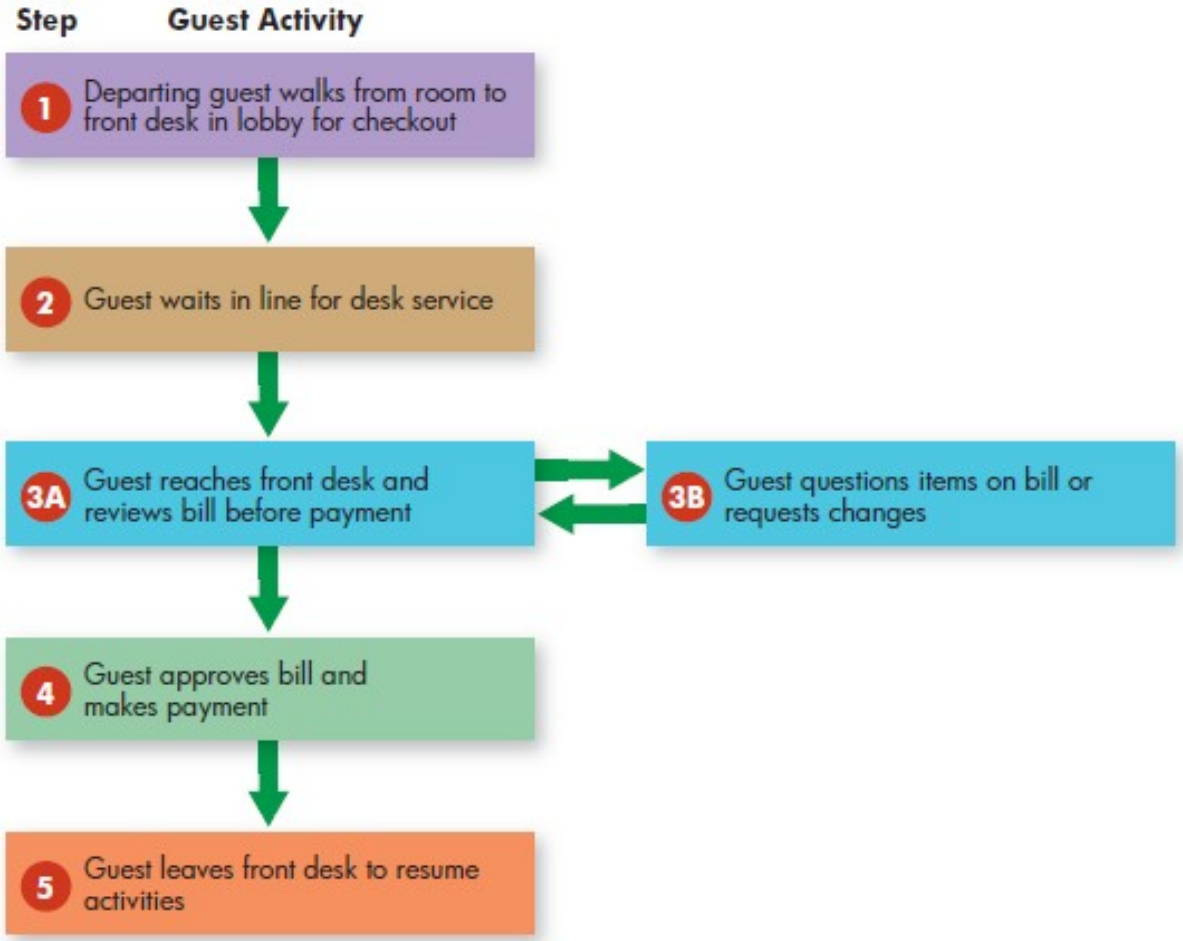
Step
Guest Activity
1
Departing guest walks from room to front desk in lobby for checkout
2
Guest waits in line for desk service
3A
Guest reaches front desk and reviews bill before payment
3B
Guest questions items on bill or requests changes
4
Guest approves bill and makes payment
5
Guest leaves front desk to resume activities

FIGURE 7.8 Flowchart of Traditional Guest Checkout

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Operations Scheduling

- **Master schedule**
  - "the game plan" for upcoming production.
- **Detailed schedules**
  - show day-to-day activities that will occur in production.
- **Staff schedules.**
  - identify who and how many employees will be working, and when
- **Project schedules**
  - provide coordination for completing large-scale projects.

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Example of Partial Master Operations Schedule

Coil # (Product)	8/4/14	8/11/14	8/18/14	...	11/3/14	11/10/14
TC016	1,500	2,500			2,100	600
TC032	900		2,700		3,000	
TR020	300		2,600			1,600

FIGURE 7.9 Example of Partial Master Operations Schedule

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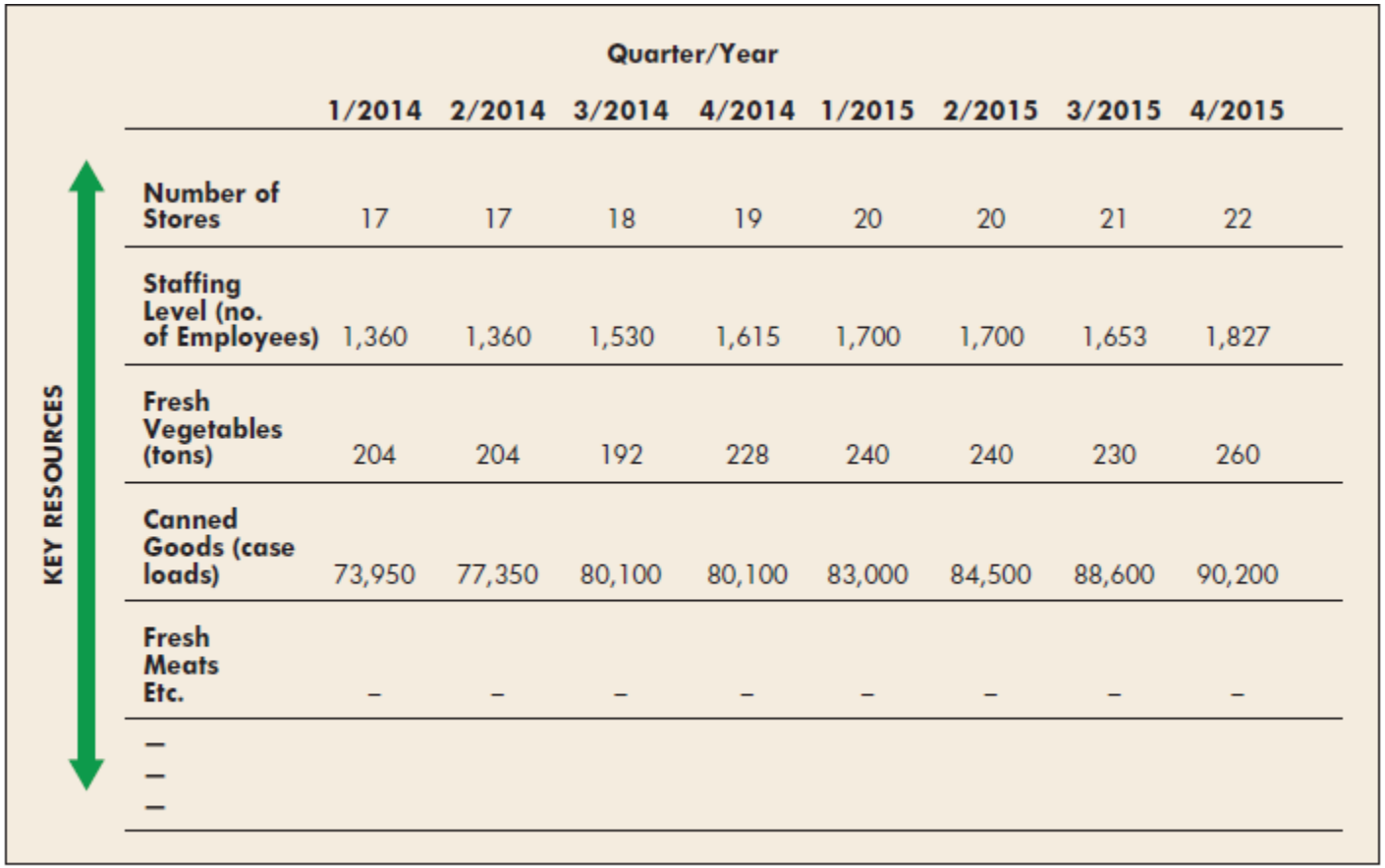
Food Retailer's Partial Operations Schedule



KEY RESOURCES	Quarter/Year 1/2014	2/2014	3/2014	4/2014	1/2015	2/2015	3/2015	4/2015
Number of Stores	17	17	18	19	20	20	21	22
Staffing Level (no. of Employees)	1,360	1,360	1,530	1,615	1,700	1,700	1,653	1,827
Fresh Vegetables (tons)	204	204	192	228	240	240	230	260
Canned Goods (case loads)	73,950	77,350	80,100	80,100	83,000	84,500	88,600	90,200
Fresh Meats Etc.	–	–	–	–	–	–	–	–
–								
–								
–								

FIGURE 7.10 Food Retailer's Partial Operations Schedule

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Project Scheduling

- **Gantt Chart**
  - production schedule that breaks down large projects into steps to be performed and specifies the time required to perform each step.
- **Pert Chart**
  - production schedule specifying the sequence of activities, time requirements, and critical path for performing the steps in a project.

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Gantt Chart

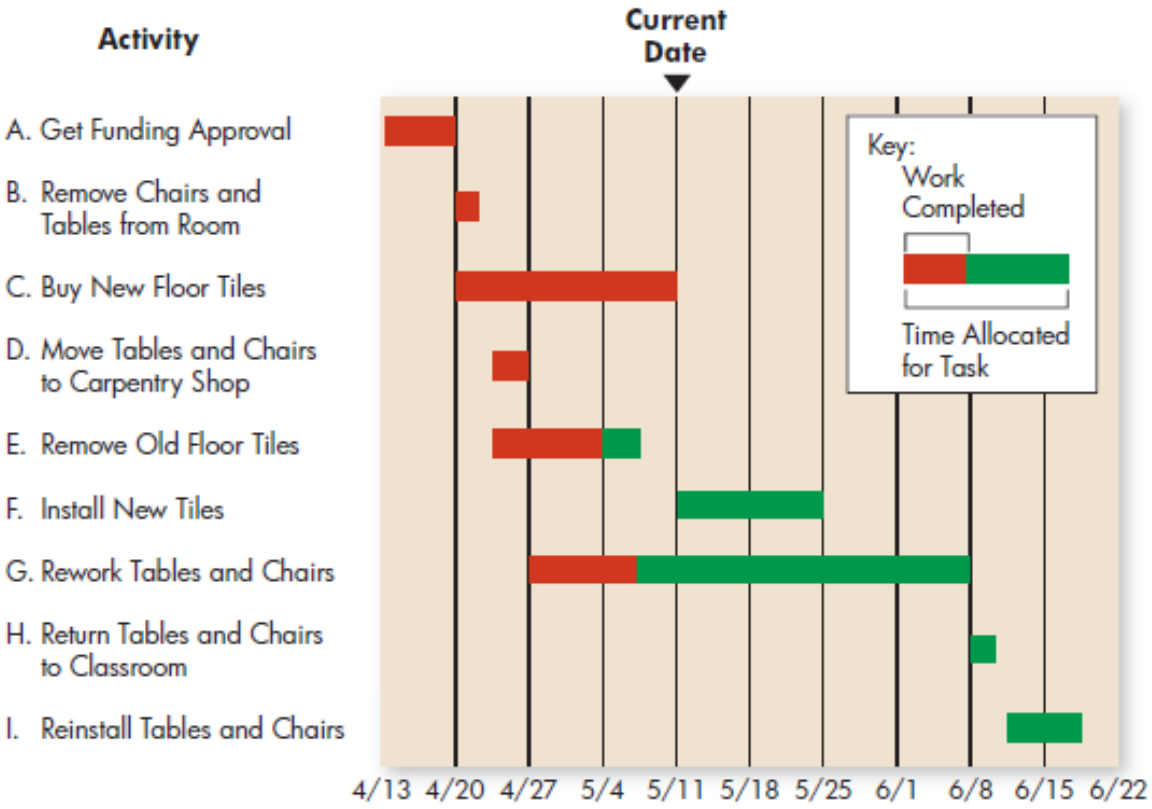
Activity
Current Date
A. Get Funding Approval
B. Remove Chairs and Tables from Room
C. Buy New Floor Tiles
D. Move Tables and Chairs to Carpentry Shop
E. Remove Old Floor Tiles
F. Install New Tiles
G. Rework Tables and Chairs
H. Return Tables and Chairs to Classroom
I. Reinstall Tables and Chairs
Key:
Work Completed
Time Allocated for Task
4/13 4/20 4/27 5/4 5/11 5/18 5/25 6/1 6/8 6/15 6/22

FIGURE 7.11 Gantt Chart

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PERT Chart

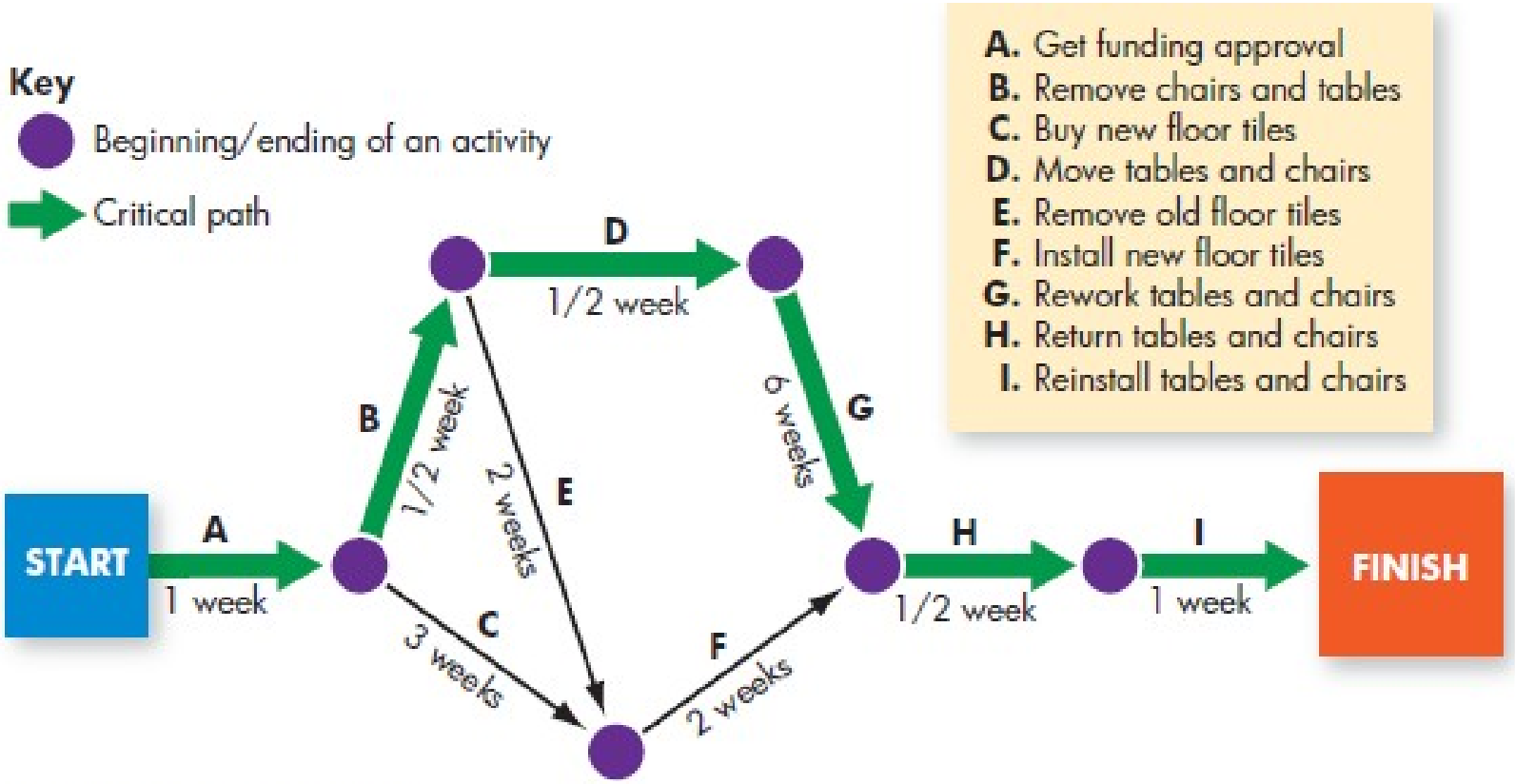

FIGURE 7.12 PERT Chart

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Operations Control

- **Operations Control**
  - process of monitoring production performance by comparing results with plans and taking corrective action when needed.
- **Follow-Up**
  - operations control activity for ensuring that production decisions are being implemented.
- **operations control includes:**
  - **material management**
  - **quality control.**

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Materials Management

- **Materials management**
  - the process by which managers plan, organize, and control the flow of materials from sources of supply through distribution of finished goods.
  - Materials managers engage in the following areas that compose materials management of physical products:

    1- Supplier Selection
    - *process of finding and choosing suppliers from whom to buy*

    2- Purchasing
    - *acquisition of the materials and services that a firm needs to produce its products.*

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Materials Management

3- Transportation

- *activities in transporting resources to the producer and finished goods to customers*

4- Warehousing

- *storage of incoming materials for production and finished goods for distribution to customers*

5- Inventory Control

- *process of receiving, storing, handling, and counting of all raw materials, partly finished goods, and finished goods*

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Materials Management

- **Lean Production System**
  - production system designed for smooth production flows that avoid inefficiencies, eliminate unnecessary inventories, and continuously improve production processes.
- **Just-in-Time (JIT) Production**
  - type of lean production system that brings together all materials at the precise time they are required at each production stage.

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Quality Control

- **Quality and productivity** are watchwords in today's competitive environment. Companies are not only measuring productivity; they also are requiring quality. Hence they do both quality control and productivity measurement.
- **Quality Control**
  - action of ensuring that operations produce products that meet specific quality standards.
- **Productivity**
  - the amount of output produced compared with the amount of resources used to

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Managing for Quality

- **Total Quality Management (TQM)**
  - all activities involved in getting high quality goods and services into the marketplace.

- **Quality Ownership**
  - principle of total quality management that holds that quality belongs to each person who creates it while performing a job.

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Tools for Total Quality Management

- **Competitive Product Analysis**
  - process by which a company analyzes a competitor's products to identify desirable improvements.
- **Value-Added Analysis**
  - process of evaluating all work activities, materials flows, and paperwork to determine the value that they add for customers.
- **Quality Improvement Team**
  - TQM tool in which collaborative groups of employees from various work areas work together to improve quality by solving common shared production problems.

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Tools for Total Quality Management (cont.)

- **ISO 9000**
  - program certifying that a factory, laboratory, or office has met the quality management standards set by the International Organization for Standardization.
- **ISO 14000**
  - certification program attesting to the fact that a factory, laboratory, or office has improved its environmental performance.
- **Business Process Reengineering**
  - rethinking and radical redesign of business processes to improve performance, quality, and productivity.

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Adding Value Through Supply Chains

- **Supply Chain (Value Chain)**
  - flow of information, materials, and services that starts with raw-materials suppliers and continues adding value through other stages in the network of firms until the product reaches the end customer
- **Supply Chain Management (SCM)**
  - principle of looking at the supply chain as a whole to improve the overall flow through the system

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Supply Chain

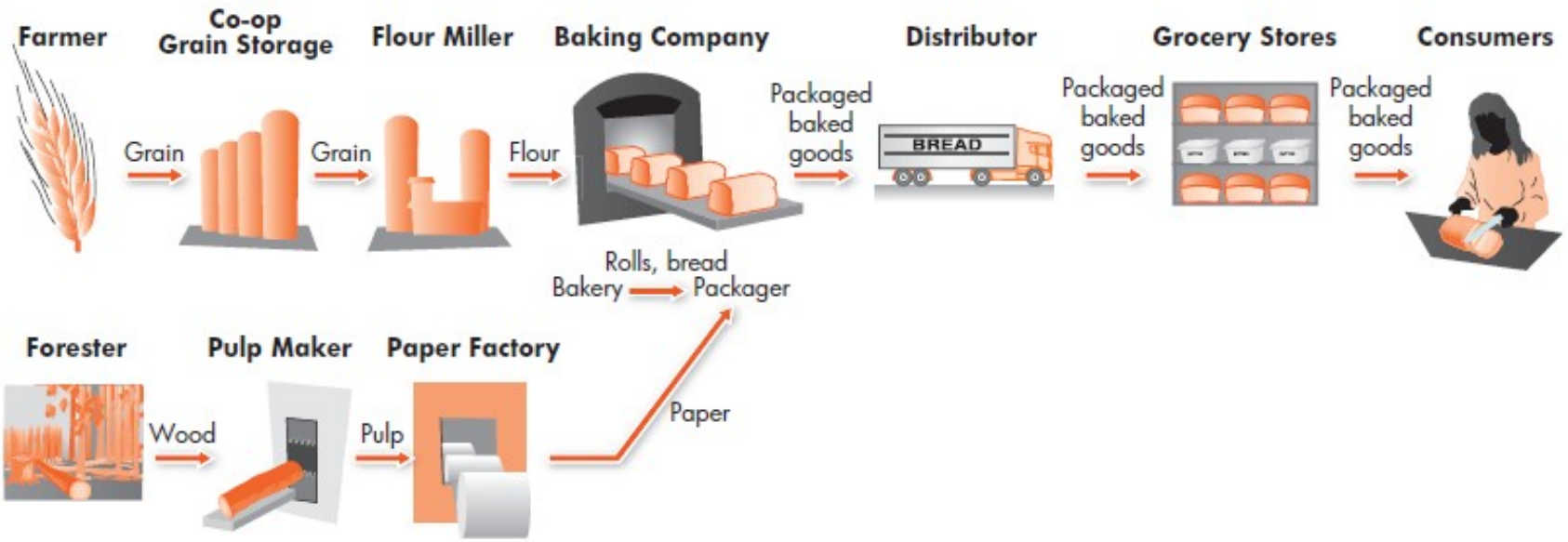

FIGURE 7.13 Supply Chain for Baked Goods

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Outsourcing and Global Supply Chains

- **Outsourcing**
  - It is a strategy of replacing internal processes by paying suppliers and distributors to perform business processes or to provide needed materials or services.

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